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TESTS WITH TOP-ICED LETTUCE AND CARROTS IN FAN CARS, AUGUST-SEPTEMBER, 1946

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TESTS WITH TOP-ICED LETTUCE AND CARROTS IN FAN CARS, AUGUST-SEPTEMBER, 1946 1/

The primary purpose of these tests was to determine whether or not fan cars are of advantage in the transit refrigeration of package-iced and top-iced lettuce and carrots. Included also were tests on several methods of icing in standard cars and fan cars, (initial ice, no bunker ice, re-top-icing in transit); cars with bunkers collapsed; fans on and fans off; and comparisons of two types of ice chemically treated for the control of bacteria and molds.

Outline of test

The following cars of lettuce and carrots were loaded in Salinas, California, on August 30, 1946. They were shipped to New York City via S. P., U. P., C. & N. W., N. Y. C.

Car	Type	Refrigeration	Shipper
		Lettuce	
1. PFE-63812	Fan	Fans off, 20,000 lbs. top-ice, dry bunkers.	Merrill
2. PFE-64689	Do.	Fans on, Do.	Do.
3. PFE-64755	Do.	Fans off, 20,000 lbs. top-ice, initial ice.	Garin
4. PFE-64933	Do.	Fans on, Do.	Do.
5. PFE-63936	Do.	Fans off, bunkers collapsed, 25,000 lbs. top-ice	Church
6. PFE-63686	Do.	Fans on, Do.	Do.
7. PFE-96544	Standard	20,000 lbs. top-ice, initial ice	Meyers
8. PFE-91118	Do.	20,000 lbs. top-ice, dry bunkers, re-top-iced Chicago	Do.
9. PFE-95800	Do.	Do., initial ice, Do.	Do.
10. PFE-95009	Do.	No-Bac, Flavolok, and regular ice, compared, 20,000 lbs. top-ice, initial ice.	Nutting
		Carrots	
11. PFE-65028	Fan	Fans on, 20,000 lbs. top-ice, initial ice.	Harden
12. PFE-97191	Standard	20,000 lbs. top-ice, initial ice.	Do.
13. PFE-91845	Do.	20,000 lbs. top-ice, dry bunkers, re-top-ice Chicago.	Do.

1/ Grateful acknowledgement is made to Roy R. Scott, of Harden Farms, Inc., Jack Bias of the Salinas Valley Growers & Shippers, and to the individual shippers who loaded test cars and the Pacific Fruit Express Co., for their assistance.

Since previous tests have indicated that warmest temperature are generally encountered in crates next to the side-walls of the car, temperature records were obtained in this part of the load. For this purpose, commodity temperatures were taken in the quarterlength stack, south wall, bottom and top layers. Lettuce and carrot crates are stacked on their sides in the car, with their bottoms turned toward the wall. Records of temperatures in transit were obtained with recording thermometers placed in this part of the crate. A recording thermometer was also installed near the ceiling on the south wall, quarterlength, to give a record of air temperatures within the car.

Type of load used

All of the lettuce cars except the two with collapsed bunkers were loaded with 312 crates. The seven stacks that made up each end of the load were five crates wide, four high. Thirty-two crates were placed in the doorway. Two blocks of ice, side by side on end, were placed against the car door away from the loading sides, except in cars 3 and 4 where crushed ice was blown against the door. In cars 1 and 2 the space beneath the floor racks was filled with crushed ice. In the cars with bunkers collapsed three additional stacks of lettuce were loaded, making a total of 372 crates in each of these cars. The carrot cars were loaded with 346 crates, with the doorway loaded as in the lettuce cars and each end loaded six wide in some layers instead of five wide as with lettuce.

Refrigeration

None of the cars were pre-iced, but were all loaded "dry". Initial icing was done at Watsonville Junction the day following loading, for the cars shipped under initial ice. When re-top-icing was called for it was done at Chicago, Ill. Lettuce and carrots are package-iced with about 30 pounds of crushed ice. Earlier tests (U.S.D.A. Tech. Bul. 627) have shown that package ice is an excellent means for removing field heat from the commodity rapidly. Thirty pounds of ice is sufficient to cool 75 pounds of vegetables from 90°F. to 32°F., hence is ample for this purpose. Usually some package-ice is left upon arrival, for lettuce and carrots are seldom over 70°-75°F. when they are packed, being grown in cool districts. Freedair circulation from operating the fans in transit would be expected to have little effect on the rate of cooling of lettuce -- since this cooling is accomplished by the package-ice -- nor would it be expected to influence overall refrigeration of the car in transit very much since the meltage of top-ice and bunker ice does this. However, it was thought that shipments in fan cars might show more even meltage of top-ice, and that in initially iced cars perhaps the top-ice would last longer because of the cold air forced from the bunkers.

Results

The test cars left Salinas early in the morning of August 31, the day after loading; they arrived in New York, N. Y., on September 8, during a protracted teamsters strike so that they were not unloaded the same day. Consequently the inspections upon unloading were made at different times and the results are not strictly comparable. Transit temperatures of the 13 test cars are shown in tables 1 to 3, air temperatures above the load, south wall in table 1 and commodity temperatures in bottom and top layers, south wall in tables 2 and 3 respectively. The inspection of the load with respect to bunker ice and top-ice at destination is given in table 4.

Fan cars with and without bunker ice, cars 1, 2, 3, and 4

The temperature records in these cars do not indicate any advantage from forced air circulation in transit. Initial icing gave air temperatures above the load 3° to 4° lower (car 3 and 4, table 1) than in the cars with dry bunkers (cars 1 and 2, table 1), but the temperature of the lettuce was not affected. It was satisfactorily low in all four cars irrespective of initial icing or fan operation, as indicated by the following average transit temperatures:

	Dry bunkers		Initial ice	
	Car 1 Fans off °F.	Car 2 Fans on °F.	Car 3 Fans off °F.	Car 4 Fans on °F.
Bottom layer crate	29.0	30.5	32.1	32.6
Top layer crate	34.0	32.1	32.2	32.8

Inspection of the top-ice left on arrival showed that fans operating in a car without bunker ice (car 2) melted too much top-ice to leave a safe supply upon arrival. This car of lettuce had a portion of the load, about 1/8 of the top layer crates, bare at the quarterlength and bulkhead (table 4). Despite this, however, the temperature of the lettuce was not affected since there was still package ice left, but if the time in transit had been longer, or if the lettuce had been warmer when packed, or the outside temperature higher in transit, the depletion of top-ice would have permitted higher commodity temperatures. The companion car with fans in the "off" position (car 1) had ten inches or more of ice overall the load except the two stacks next to the bulkhead which were bare.

A car initially iced, shipped with fans "on" (car 4), also showed excessive meltage of top-ice. Only about 1/3 of the top-ice was left at destination and the top of the load within 3 feet of the bunkers was bare whereas in the companion car with fans "off" (car 3) the top-ice was 8 inches deep over most of the load (table 4). The car with fans "off" was unloaded two days earlier than the other but there seems little reason for doubt that fan operation increased meltage of top-ice in these cars without much lowering of commodity temperatures.

Cars with bunkers collapsed, fans on and fans off, cars 5 and 6

As shown in Table 1 fans operating in a top-iced car with bunkers collapsed (car 6) gave appreciably lower air temperatures above the load than were obtained in a companion car with fans "off" (car 5). The average air temperatures for the trip were 33.9° and 39.6°F. respectively. Lettuce temperatures in the top layer next to the south wall in these cars were affected by these air temperatures showing 33°F. average in the car with fans "on" and 38.3°F. with fans "off".

Inspection at destination showed an ample supply of top-ice left in the car that had fans operating in transit (car 6). Top-ice was 8 to 15 inches deep to within a few inches of the sidewalls. In the other car (car 5) in which the fans were not operated less top ice remained having melted off from the last two stacks next to the collapsed bunkers. A noteworthy difference between these cars (5 and 6) was that the ice between side walls and crates had been melted by the forced air circulation in car 6 whereas in car 5 with fans "off" the channels were still about half full of ice. These cars were top-iced with 25,000 pounds of top-ice, whereas the other cars, that showed depletion of top-ice were top-iced with only 20,000 pounds.

Standard cars, cars 7, 8, and 9.

Of the three standard cars of lettuce, air temperatures were the least favorable in car 8 (table 4) that had no ice in the bunkers but was re-top-iced in Chicago. In this car they averaged 38.9°F. and were 40° or slightly higher for the last part of the trip. The companion car with bunkers initially iced but not re-top-iced (car 7) and the initially iced re-top-iced car (car 9) had better air temperatures, averaging 35.3° and 35.6° respectively. The latter car showed an air temperature of 46° on September 5, presumably when the car was opened for re-top-icing, but it soon cooled. Lettuce temperatures were low in the bottom layer of all three cars, 32.0, 30.8, and 33.2°F. in cars 7, 8, and 9 respectively, and they were also very favorable in the top layer of cars 8 and 9, both re-top-iced, averaging 32.9° and 32.7°F. respectively. The companion car, (car 7) not re-top-iced, had a corresponding (commodity) temperature of 36.8°F.

When these cars were inspected as they were unloaded September 10 and 11, they all had about the same amount of top-ice left and all had an amount ample to protect the lettuce (table 4). It would appear from this test that re-top-icing standard cars in transit gave no significantly lower commodity temperatures in the bottom layer but gave about 4° lower temperature in the top layer in this one car.

Other cars that were not re-top-iced had the following commodity temperatures (average) top layer, south wall, quarterlength:

Car 1.	Dry Bunker	34°	Car 10.	Initial ice	32.1°
Car 3.	Initial ice	32.2°			

The two cars re-top-iced in transit (8 and 9) had corresponding temperatures of 32.9° and 32.7°, not enough better than in the other cars, except car 7, to be of any importance.

Carrots; comparison of a fan car with a standard car initially iced and a standard car with dry bunkers, re-top-iced.

The carrots were slightly colder in the bottom and top layer, quarterlength, south wall, in the fan car, than in the standard car, as indicated:

	Top layer °F.	Bottom layer °F.
Fan car	36.2	41.1
Standard car	38.8	44.6
Re-top-iced car	43.1	---

The car which was not initially iced but was re-top-iced in transit, (car 13) had warmer top layer temperatures than the two companion cars. The standard car (car 12) was the only one of these three cars that did not have enough top-ice left on arrival. About 1/8 of the top layer was bare in the car, mostly at the doorway and south wall. Since the car was not unloaded at once, it was re-top-iced at destination. The fan car had a surprisingly large amount of ice left in it on arrival. The bunkers were 3/4 to 7/8 full and top-ice covered all of the load 10 to 12 inches deep except for the stacks next to the bunker. These were about half bare. This car had more top-ice left than the companion car that was re-top-iced in transit.

Comparison of "No-Bac," "Flavolok", and regular ice

Car 10 was loaded to compare the effects of 3 types of ice. One end was package-iced and top-iced with No-Bac ice, the other end was similarly iced with Flavolok ice, and the center of the car was finished with the usual type of ice. No-Bac is a patented, chemically-treated ice developed to retard the growth of micro-organisms. It contains benzoic acid, chloramine T and other ingredients in quantities reportedly safe to use on foods. Flavolok ice was developed for the same purpose; it is not patented and its composition is unknown but is reportedly somewhat similar to No-Bac ice in chemical make-up.

The car in which this comparison was made was initially iced and top-iced with 20,000 pounds of ice. It had favorable transit temperatures of about 32° at top and bottom, south wall, quarterlength. It was not unloaded until September 17 and 18, or approximately 18 days after loading, at which time the top of the load was still well covered with ice 8 to 12 inches deep. When the crates were removed, the receiver commented on the poor condition of some of the lettuce and the better condition of some of the treated lettuce. However, when inspections were made of individual crates, there was as much variation in decay, redness of butts and fresh appearance between crates of untreated lettuce as there was between treated and untreated crates.

Six test crates of lettuce, two from each part of the load, bottom and top layer, were purchased for observation as they were held on the market. When these crates were opened and compared for appearance under good illumination, they were rated as follows:

Best appearance	Flavolok	Top layer
Next best	Untreated	Bottom layer
Third best	No-Bac	Bottom layer

There was not much difference between the other three crates, that is, Flavolok, bottom layer, untreated, top layer, No-Bac, top layer.

When the crates were unpacked, severe freezing injury was found along one side of all top layer crates and slight freezing of leaves inside of bottom and top crates. The glassiness together with bruising made all packages look ragged. The following table compares the lettuce upon arrival:

Table 5. Condition on arrival of lettuce packed with different types of ice.

Type of ice	Position	No. heads decayed	Redness of butts	Amount ice in crates
				Pounds
Regular	Top layer	2	Medium	10
Regular	Bottom layer	2	Do.	10
No-Bac	Top layer	2	Do.	4
No-Bac	Bottom layer	1	Slight	1
Flavolok	Top layer	1	Do.	12
Flavolok	Bottom layer	4	Medium	10

There was no significant difference in the amount of decay or discoloration of butts which could be attributed to the different types of ice used. The test crates were held for five days after unloading, until they showed deterioration, (two days at 75°F. and 3 days at 42°F.). The amount of decay found is indicated in table 6.

Table 6. Condition of lettuce packed with different types of ice, 5 days after arrival.

Type of ice	Decay [1]	
	Severe	Slight
	Pct.	Pct.
Regular	36	63
No-Bac	32	67
Flavolok	34	66

1/ Mostly gray mold rot. Average of two crates, each lot.

It is obvious from this holding test that all the lettuce decayed to about the same extent and that neither of the chemically treated ices exerted a noticeable preservative effect.

Summary

Differences in temperature and ice meltage observed between cars were small, therefore they are not conclusive. Further tests will be necessary to give more conclusive results.

Table 1. Temperature of air at ceiling, quarterlength, south wall, in lettuce and carrot cars enroute from Salinas, Calif., to New York, N.Y. August 30 to September 9, 1946

Car 1/

Date	Time	Lettuce							Carrots					
		1	2	3	4	5	6	7	8	9	10	11	12	13
		Dry bunkers Fans off °F.	Dry bunkers Fans on °F.	Initial ice Fans off °F.	Initial ice Fans on °F.	Bunkers collapsed Fans off °F.	Bunkers collapsed Fans on °F.	Initial ice No fans °F.	Dry bunkers retopped Chicago No fans °F.	Initial ice retopped Chicago No fans °F.	Initial ice No fans °F.	Initial ice Fans on °F.	Initial ice No fans °F.	Dry bunkers retopped Chicago No fans °F.
8/30	Midnight	31	34	30	30	36	32	33	36	32	32	--	30	32
8/31	Noon	32	35	30	30	38	32	33	36	31	32	--	28	33
	Midnight	32	36	32	32	37	32	33	36	32	32	--	30	33
9/1	Noon	32	36	32	32	38	31	33	36	32	33		30	33
	Midnight	32	36	32	32	36	31	33	36	32	33		30	34
9/2	Noon	33	37	33	32	43	35	34	38	36	34		30	34
	Midnight	33	36	32	32	36	32	35	36	35	34		30	34
9/3	Noon	35	38	34	33	40	34	35	38	40	35		29	34
	Midnight	32	36	33	33	37	32	35	36	35	34		30	34
9/4	Noon	36	38	35	33	40	35	35	40	40	36		32	36
	Midnight	34	38	34	34	37	35	36	40	36	36		32	36
9/5	Noon	40	37	36	33	40	36	36	40	46	37		33	40
	Midnight	37	34	32	33	36	33	36	40	36	36		32	40
9/6	Noon	42	42	36	33	43	36	37	42	35	36		33	42
	Midnight	39	38	35	37	42	33	38	40	35	37		32	40
9/7	Noon	43	38	36	35	43	36	37	42	37	38		34	43
	Midnight	39	36	34	35	41	34	37	40	35	37		32	41
9/8	Noon	40	37	35	33	42	34	37	41	35	34	--	34	44
	Midnight	40	40	35	32	42	35	37	42	36	33	--	34	--
9/9	Noon	44	44	38	33	46	40	37	44	37	35	--	34	--
	Mean	36.3	37.3	33.7	32.8	39.6	33.9	35.3	38.9	35.6	34.7		31.4	36.8

No record Thermometer failed

1/ All cars 20,000 pounds top ice except 5 and 6. 25,000 pounds top ice.

Table 2. Temperature of lettuce and carrots, bottom layer, quarterlength, south wall, enroute from Salinas, Calif. to New York, N.Y., Aug. 30 to Sept. 9, 1946

Date	Time	Car 1/ Lettuce 1 Dry bunkers Fans off °F.	2 Dry bunkers Fans on °F.	3 Initial ice Fans off °F.	4 Initial ice Fans on °F.	5 Bunkers collapsed Fans off °F.	6 Bunkers collapsed Fans on °F.	7 Initial ice No fans °F.	8 Dry bunkers retopped Chicago No fans °F.	9 Initial ice retopped Chicago No fans °F.	10 Initial ice No fans °F.	Carrots 11 Initial ice Fans on °F.	12 Initial ice No fans °F.	13 Dry bunkers retopped Chicago No fans °F.
8/30	Noon	38	45	--	--	46	46	39	42	36	42	58	--	52
	Midnight	30	33	35	35	31	36	33	33	35	33	47	44	40
8/31	Noon	28	32	32	33	29	33	32	31	34	32	43	40	38
	Midnight	29	31	32	33	28	32	32	31	34	32	42	40	40
9/1	Noon	29	31	32	33	28	32	32	30	34	32	41	41	42
	Midnight	29	30	32	33	28	32	32	30	33	32	40	42	42
9/2	Noon	29	30	32	33	28	31	32	30	33	32	40	42	42
	Midnight	29	30	32	33	28	31	32	30	33	32	40	44	44
9/3	Noon	29	30	32	33	28	31	32	30	33	32	40	44	45
	Midnight	29	30	32	33	28	31	32	30	33	32	40	46	46
9/4	Noon	29	30	32	33	28	31	32	31	33	32	40	45	47
	Midnight	29	30	32	32	28	31	32	31	33	32	40	46	47
9/5	Noon	29	30	32	32	28	31	32	31	33	32	42	48	50
	Midnight	29	30	32	33	28	31	32	31	33	32	42	48	49
9/6	Noon	29	30	32	32	28	31	32	31	33	32	42	46	--
	Midnight	29	30	32	32	28	31	32	31	33	32	42	46	--
9/7	Noon	29	30	32	32	28	31	32	31	33	32	42	46	--
	Midnight	29	31	32	32	28	31	32	31	33	(32)	40	46	--
9/8	Noon	29	31	32	32	28	31	32	31	33	(32)	40	47	--
	Midnight	29	31	32	32	28	31	32	31	33	(32)	40	46	--
9/9	Noon	29	31	32	32	28	31	32	31	33	(32)	41	46	--
	Mean	29.0	30.5	32.1	32.6	28.2	31.5	32.0	30.8	3382	32.0	41.1	44.6	

1/ All cars 20,000 pounds top ice, except 5 and 6, 25,000 pounds top ice.

Table 3. Temperature of lettuce and carrots, top layer, quarterlength, south wall, enroute from Salinas, Calif., to New York, N.Y., Aug. 30 to Sept. 9, 1946

Date	Time	Car 1/ Lettuce 1 Dry bunkers Fans off °F.	2 Dry bunkers Fans on °F.	3 Initial ice Fans off °F.	4 Initial ice Fans on °F.	5* Bunkers collapsed Fans off °F.	6 Bunkers collapsed Fans on °F.	7* Initial ice No fans °F.	8 Dry bunkers retopped Chicago No fans °F.	9 Initial ice retopped Chicago No fans °F.	10 Initial ice No fans °F.	Carrots 11 Initial ice Fans on °F.	12 Initial ice No fans °F.	13 Dry bunkers retopped Chicago No fans °F.
8/30	Noon	45	38	—	—	54	45	44	50	45	42	49	44	62
	Midnight	35	33	33	35	40	34	36	35	34	34	40	38	42
8/31	Noon	34	31	31	32	38	32	35	33	33	32	37	38	38
	Midnight	34	31	31	32	37	32	35	33	33	32	37	37	40
9/1	Noon	34	31	30	32	37	32	36	32	32	32	36	37	39
	Midnight	33	31	30	32	37	32	36	32	32	32	35	37	41
9/2	Noon	33	31	30	32	37	32	36	32	32	32	35	39	41
	Midnight	33	31	30	32	37	32	36	32	32	32	36	37	43
9/3	Noon	33	31	30	32	37	32	37	32	32	32	35	39	44
	Midnight	33	31	30	32	38	32	37	32	32	32	37	38	44
9/4	Noon	33	32	32	32	37	32	37	32	32	32	35	38	45
	Midnight	33	32	32	32	38	33	37	32	32	32	37	40	45
9/5	Noon	34	33	33	32	38	34	37	33	33	32	36	40	47
	Midnight	34	32	33	33	38	34	37	33	33	32	36	39	47
9/6	Noon	34	33	33	33	38	34	37	33	33	32	37	40	45
	Midnight	34	33	34	33	40	34	37	33	33	32	36	40	45
9/7	Noon	35	33	35	34	40	34	38	33	33	32	35	40	45
	Midnight	35	33	34	34	40	34	38	33	33	32	36	40	43
9/8	Noon	35	33	34	34	40	34	38	34	33	32	36	40	43
	Midnight	35	33	34	34	40	34	38	34	33	32	35	40	--
9/9	Noon	36	34	36	35	40	34	38	35	34	32	37	40	--
	Mean	34.0	32.1	32.2	32.8	38.3	33.0	36.8	32.9	32.7	32.1	36.2	38.8	43.1

1/ All cars 20,000 pounds top ice except 5 and 6, 25,000 pounds top ice.

Table 4. Inspection of loads at destination.

Car No. PFE	Type of car	Refrigeration 1/	Date Inspected	Amount of ice on arrival, decay, remarks
				Lettuce
1. 63812	Fan	Fans off, dry bunkers	Sept. 9	Load well covered with ice; at doorway, 10-15 inches deep, at quarterlength, top-ice 1 inch from ceiling, no top-ice on top of 2 stacks next to bulkhead. Ice along sidewall, 3/4 distance from floor to ceiling, no decay test crates.
2. 64689	Fan	Fans on, dry bunkers	Sept. 9	At doorway top-ice 13 inches deep on crates near wall, only 5 inches deep along centerline; at quarterlength and bulkhead large areas along centerline no top-ice left, channel next side walls about half full, no decay test crates. Possibly 1/8 of load "bare". Fan car, no bunker ice, melted too much top-ice.
3. 64755	Fan	Fans off, initial ice	Sept. 10	Bunkers 3/4 full, top-ice averaged 8 inches deep at doorway, quarterlength, covering all parts load except at bulkhead, half of crates (10 inches) here were "bare". Decay affected 30 percent of heads in top crate, 6 percent bottom crate.
4. 64933	Fan	Fans on, initial ice	Sept. 12	Bunker about 1/4 full. Probably slightly less than 1/3 of top-ice left, about 1/2 load covered, no top-ice within 3 feet of bunkers. Ice next to sidewalls about 2/3 distance from floor to top of load. Decay affected 20 percent of heads in top crates, no decay in bottom crate. Additional time and air circulation melted more top-ice and bunker ice than in companion car 3.
5. 63936	Fan	Fans off, bunkers collapsed	Sept. 9	Top-ice 12-15 inches thick at doorway, no ice left on 2 stacks next to ends of cars, channel ice along walls about 1/2 way to top of load.
6. 63686	Fan	Fans on, bunkers collapsed	Sept. 9	Top-ice uniformly over load 8-15 inches thick to within few inches of car walls. No ice left between sidewalls and crates except at doorway. No decay in test crates.
7. 96544	Standard	Initial ice	Sept. 11	Bunker 3/4 to 7/8 full, top-ice averaged 10 inches thick, but melted back from bunkers and sidewalls about 10 inches. No ice left in channel along south wall, along north wall 1/2 full. No decay in top and bottom test crates.

Table 4. continued

Car No.	Type of car	Refrigeration	Date Inspected	Amount of ice on arrival, decay, remarks
PFE				Lettuce
8. 91118	Standard	Dry bunkers, re-topped Chicago	Sept. 11	Top-ice about 12 inches thick along centerline, slightly less near walls, ice on top of stack next to bunker except corner crates, they were bare. Top and bottom test crates contained very little package ice, about 10 percent of heads these crates affected with decay.
9. 95800	Standard	Initial ice, re-top-iced Chicago.	Sept. 10	Bunkers 60 percent full, top-ice almost to ceiling at doorway, 12 inches deep elsewhere. No top-ice on stack next to bulkheads. No decay in top and bottom test crates.
10. 95009	Standard	Initial ice	Sept. 17-18	Top-ice 8 to 10 inches. For condition of lettuce see text.
				Carrots
11. 65028	Fan	Fans on, initial ice	Sept. 16	Bunkers 3/4 to 7/8 full, top-ice covered all of load between 10 and 12 inches deep except for stacks next to bunker, these about half bare. Channels full of ice. No decay, some leaves yellow.
12. 97191	Standard	Initial ice	Sept. 9	Inspected from doorway indicated no ice on crates along south wall, estimated about 1/8 of top- bare, mostly at doorway and south wall. Car was re-top-iced Sept. 10, with 4,000 pounds.
13. 91845	Standard	Dry bunkers, re-top-iced, Chicago	Sept. 8	Top-ice at doorway within 2 inches of ceiling, over rest of load 8 inches deep except at bunkers where there were some bare spots and mounds of ice 4 inches deep. Half of bunker and next stack bare, channels well filled with ice. No decay, some leaves spotted, slightly yellow.

1/ All cars top-iced with 20,000 pounds, except those with bunkers collapsed, cars 5 and 6; 25,000 pounds used in these cars.

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